

ABSTRACT

Charge-transfer materials are demonstrated to be useful for generating femtosecond holographic gratings. Using semiconducting polymers sensitized with varying concentrations of C₆₀, absorption holographic gratings with diffraction efficiencies of 1.6% were recorded with individual ultrafast laser pulses; the diffraction efficiency and time decay of the gratings were measured using nondegenerate four-wave mixing. High quantum efficiency for electron transfer reduces the effects of early recombination which otherwise limits the density of excitations in pure polymers, and the metastability of the charge transfer enables tuning of the decay dynamics by controlling the concentration of acceptors in the mixture.